

1986). *Cyprinella lutrensis* is a new host for *Bothriocephalus acheilognathi*. This report expands the range of the Asian fish tapeworm to include the Muddy River in Nevada and suggests a potential for its spread by way of infected baitfish.

Two whole mounts of *Bothriocephalus acheilognathi* have been deposited with the Harold W. Manter collection, University of Nebraska State Museum, voucher numbers HWML 35094 and HWML 35095. Two slides with sections of fish intestine infected with *B. acheilognathi* were also deposited with the same collection, voucher numbers HWML 35096 and HWML 35097.

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Research Note

Acanthocephala of the Virginia Opossum (*Didelphis virginiana*) in Arkansas, with a Note on the Life History of *Centrorhynchus wardae* (Centrorhynchidae)

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ABSTRACT: *Centrorhynchus wardae* was collected from the small intestines in 2 of 8 Virginia opossums (*Didelphis virginiana*) examined from Van Buren County, Arkansas, representing a new host record. Because all reports of this acanthocephalan have been of immature specimens collected from mammals, it appears that these represent aberrant infections. The diverse array of mammalian hosts is indicative of the low degree of host specificity exhibited by this parasite. *Oligacanthorhynchus tortuosa* was found in 10 of 15 opossums examined from Van Buren, Washington, and Yell counties in Arkansas, representing a new geographic distribution record for this parasite in the opossum.

KEY WORDS: *Centrorhynchus wardae*, *Oligacanthorhynchus tortuosa*, Acanthocephala, opossum, *Didelphis virginiana*.

The small intestines of 15 Virginia opossums (*Didelphis virginiana*) were examined postmortem for acanthocephalan infections between January and November 1991. The opossums were

live-trapped in Van Buren, Washington, and Yell counties in Arkansas. Two species of acanthocephalans were found, *Centrorhynchus wardae* Holloway, 1958, and *Oligacanthorhynchus tortuosa* (Leidy, 1850) Schmidt, 1972.

Centrorhynchus wardae was found in 2 of 8 opossums from Van Buren County, Arkansas, constituting a new host record for this parasite. One male worm and 1 female worm, and a single female worm, respectively, were found in 2 adult male opossums. All worms were immature. Voucher specimens were deposited in the Harold W. Manter Laboratory, University of Nebraska, Lincoln (accession No. HWML 35091). The only previous report of *C. wardae* from Arkansas was by Richardson et al. (1992), who reported 3 specimens of *C. wardae* from 2 of 30 raccoons (*Procyon lotor*) examined from Van Buren County. The opossums and raccoons hosting *C. wardae*

were all collected within a 1-mile radius. The geography of this collection site and the surrounding area was described by Richardson et al. (1992).

Although extensive helminthological surveys have been conducted throughout the southeastern United States, only 10 specimens of *C. wardae* have been reported prior to this study. *Centrorhynchus wardae* was originally described by Holloway (1958), who examined 5 immature worms from the alimentary canal of a spotted skunk (*Spilogale putorius*) from Giles County, Virginia. In addition to those reported by Richardson et al. (1992), single immature specimens have been reported from the small intestine of a gray fox (*Urocyon cinereoargenteus*) in Florida (Conti, 1984) and an aquatic, green frog (*Rana clamitans*) from Pocahontas State Park, Chesterfield County, Virginia (Campbell, 1968).

The specimens recovered in this study conform to the original description of *C. wardae* by Holloway (1958) with regard to the number of longitudinal rows of hooks (34–36); however, slight discrepancies were found in the number of hooks per row, in the number of the large, anterior hooks, and in the size of the thorns at the base of the proboscis. The description of *C. wardae* states that the first 5 hooks are more sturdy and recurved than the posterior ones. In the specimens found in this study, the first 4 or 5 anterior most hooks were larger ($57.6 \mu\text{m} \pm 7.6 \mu\text{m}$ [$\bar{x} \pm \text{SE}$]; range = 40–70 μm ; $N = 26$) and more recurved than the posterior ones ($42.9 \mu\text{m} \pm 7.8 \mu\text{m}$; range = 29–62 μm ; $N = 66$). This arrangement is characteristic of *C. conspectus* described by Van Cleave and Pratt (1940). The 17 or 18 hooks per row possessed by the specimens in this study also conform to the description of *C. conspectus* (16–19). *Centrorhynchus wardae* is reported to have 18–20 hooks per row. Aside from the noted exceptions, the specimens recovered in this study most closely resemble *C. wardae*; however, the resemblance of this species to *C. conspectus* warrants mention. The original description of *C. wardae* was based on 5 specimens and should probably be expanded to accommodate 4 or 5 larger, anterior hooks and 17–20 hooks per row. Clearly, the most salient character that distinguishes immature *C. wardae* from *C. conspectus* is the number of longitudinal rows of hooks.

Ward (1940) recovered 11 encysted juvenile acanthocephalans of the genus *Centrorhynchus* from the intestinal wall of a water snake (*Nerodia*

sipedon). Her description of these immature worms closely resembles both *C. wardae* and *C. conspectus*. She reported 28–33 longitudinal rows of 18–22 hooks, the first 4 being larger than the posterior ones. These ranges overlap with both *C. conspectus* and *C. wardae*. Unfortunately, critical taxonomic assessment of these 2 species will be possible only when mature specimens of *C. wardae* become available.

All evidence indicates that individuals of the genus *Centrorhynchus* utilize birds exclusively as their natural definitive hosts; however, they have been reported from a number of mammals throughout the world (Van Cleave, 1953). Van Cleave (1953) suggested that these were accidental infections obtained when mammals ingest infected birds or second intermediate hosts. Successful experimental infections of rats with *C. spinosus* (normally a parasite of birds) fed cyst-acanths taken from a garter snake (second intermediate host), suggest a low degree of host specificity (Read, 1950). The reports of *C. wardae* from 4 families of mammals and 1 amphibian enhance this view. Van Cleave (1953) concluded that the limitation of birds as the normal definitive hosts for *Centrorhynchus* spp. was a result of feeding habits rather than any mammalian physiological condition inimical to the establishment of the worms. The low prevalence of *C. wardae* in mammals suggests that these animals represent accidental hosts for this parasite and probably do not make a significant contribution to its transmission. All reported specimens of *C. wardae* were immature, further supporting the concept of mammals as aberrant hosts for *Centrorhynchus* spp. Although the normal definitive host for *C. wardae* is not presently known, it is probably a bird.

Oligacanthorhynchus tortuosa, a common acanthocephalan of the opossum throughout its range in North America, was found in 10 of 15 opossums examined. This represents a new geographic distribution record for this parasite in the opossum. Voucher specimens have been deposited at the Harold W. Manter Laboratory (accession No. HWML 35092). Among infected opossums, the mean intensity ($\pm \text{SE}$) was 16.8 (± 29.3) with a range of 1–99. Seven of 10, 3 of 5, and 2 of 2 opossums from Van Buren, Washington, and Yell counties, respectively, were infected.

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Research Note

Piscicolaria reducta (Hirudinea: Piscicolidae) from Fishes in a Subtropical Florida Stream

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ABSTRACT: The leech *Piscicolaria reducta* was found on the fins of 39 of 114 fishes collected from Blackwater Creek, Florida, from October 1982 to July 1983. Six species of fish were infested: *Pomoxis nigromaculatus*, *Erimyzon suetta*, *Tilapia aurea*, *Lepomis gulosus*, *L. auritus*, and *L. punctatus*. The former 5 species and *Micropterus salmoides*, taken in a Hillsborough River collection, represent new host records. For the commonly collected fish species, prevalence (81.8%) and mean intensity (4.4) of *P. reducta* was highest on *L. gulosus*, followed by *L. auritus* (32%, 1.6) and *L. punctatus* (30.6%, 1.7). Considering all fish species, the caudal fin was the most common infestation site (49.4%), followed by the dorsal (23.1%), anal (13.2%), pectoral (9.9%), and pelvic fins (4.4%). This differential distribution on fins may be caused by differences in fin surface areas and movement and placement of fins associated with fish movements.

KEY WORDS: Hirudinea, *Piscicolaria reducta*, prevalence, intensity, survey, freshwater fish, Florida.

Piscicolaria reducta Meyer, 1940, is a widely distributed freshwater leech, reported from 19 states in the United States and 1 province in Canada east of the Rocky Mountains. It has low

host specificity and has been found on 19 species in 6 genera and 4 families of fishes (Table 1). The purposes of this paper are to report an extension of the geographical range of *P. reducta* into Florida, report 6 new host records, and describe the prevalence and intensity of this parasite for a fish community in a small stream in west central Florida.

Blackwater Creek (28°10'N) is a tributary of the Hillsborough River and drains land in Hillsborough and Polk counties, Florida. The study site (Sec. 9, R. 21E., T. 27S., Hillsborough Co., Florida) was 4–12 m wide, consisted of a series of shallow (1–2 m deep) pools connected by riffles and contained patches of submergent vegetation (*Egeria densa*, *Potamogeton illinoensis*, *Vallisneria neotropicalis*). Riffle substrate consisted of boulders and gravel, whereas sand, silt, and leaves covered the bottom of pools. Fish collections were made in October 1982 and January, February, April, and July 1983. Fish were collected by electroshocking (mean operating time per col-